[10191/3980]

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	Examiner: R. Dhingra
Franz LAERMER	
For: DEVICE AND METHOD FOR THE PRODUCTION OF CHLORINE TRIFLUORIDE AND SYSTEM FOR ETCHING SEMICONDUCTOR SUBSTRATES USING THIS DEVICE	Art Unit: 1716
Filed: December 28, 2004	
Serial No.: 10/519,724	

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I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office via the Office electronic filing system on **December 10, 2010**.

Signature: /Kevin Kambo/
Kevin Kambo

APPEAL BRIEF PURSUANT TO 37 C.F.R. § 41.37

SIR:

On October 12, 2010, Appellant submitted a Notice of Appeal from the last decision of the Examiner contained in the Final Office Action dated June 3, 2010 in the above-identified patent application

In accordance with 37 C.F.R. § 41.37, this brief is submitted in support of the appeal of the rejections of claims 14 to 31. For at least the reasons set forth below, the final rejections of claims 14 to 31 should be reversed.

1. REAL PARTY IN INTEREST

The real party in interest in the present appeal is ROBERT BOSCH GMBH of Stuttgart in the Federal Republic of Germany, which is the assignee of the entire right, title and interest in and to the present application.

2. RELATED APPEALS AND INTERFERENCES

There are no other prior or pending appeals, interferences or judicial proceedings known by the undersigned, or believed by the undersigned to be known to Appellant or the assignee, ROBERT BOSCH GMBH, "which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal."

3. STATUS OF CLAIMS

Claims 1 to 13 have been canceled.

Claims 14 to 31 are pending.

Claims 14, 16 to 22, 27, 29, and 30 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of allegedly admitted prior art ("AAPA"), U.S. Patent No. 3,354,646 ("Walter et al."), "Highly Selective Etching of Si_3N_4 to SiO_2 Employing Fluorine and Chlorine Atoms Generated by Microwave Discharge" ("Suto et al."), and U.S. Patent Application Publication No. 2001/0007275 ("Yanagisawa et al.").

Claim 15 stands rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and U.S. Patent No. 5,756,400 ("Ye et al.").

Claims 23 and 26 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and U.S. Patent No. 6,136,214 ("Mori et al.").

Claim 24 stands rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and U.S. Patent No. 6,953,557 ("Ikeda et al.").

Claim 25 stands rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and Ye et al.

Claims 28 and 31 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of AAPA, Walter et al., Suto et al., and U.S. Patent No. 5,641,380 ("Yamazaki et al.").

A copy of the appealed claims, *i.e.*, claims 14 to 31, is attached hereto in the Claims Appendix.

4. STATUS OF AMENDMENTS

In response to the Final Office Action dated June 3, 2010, Appellant submitted a "Reply Under 37 C.F.R. § 1.116" on September 3, 2010. The Reply Under 37 C.F.R. § 1.116 did not include any proposed amendments to the claims. It is Appellant's understanding that the claims as included in the annexed "Claims Appendix" reflect the current claims.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 14 relates to a device (6) for generating chlorine trifluoride. *Specification* at page 2, line 27 to page 3, line 2 and page 4, lines 22 to 25. Claim 14 recites that the device includes a plasma reactor (100). *Specification* at page 2, line 27 to page 3, line 2. Claim 14 recites that the device (6) includes plasma generating means (110, 120, 130, 150, 155, 160, 170, 180) via which a high-density plasma (105) can be generated in the interior of the plasma reactor (100). *Specification* at page 2, line 27 to page 3, line 2. Claim 14 recites that the device (6) includes a first gas. *Specification* at page 2, line 27 to page 3, line 2. Claim 14 recites that the device includes a second gas selected to react with the first gas to form chlorine trifluoride when under the influence of a high-density plasma. *Specification* at page 2, line 27 to page 3, line 2. Claim 14 recites that the device (6) includes gas supply means (21, 25, 22, 26) via which the first gas and the second gas can be supplied to the plasma reactor (100), these gases reacting with one another under the influence of the high-density plasma (105) in the plasma reactor (100), forming chlorine trifluoride, and a gas outlet (20) via which the formed chlorine trifluoride can be removed from the plasma reactor (100). *Specification* at page 2, line 27 to page 3, line 2. Claim 14 recites that the gas supply means (21, 25, 22, 26) includes a first mass flow regulator (22) configured to regulate the first gas to a first flow rate to the plasma reactor (100). *Specification* at page 5, lines 7 to 10. Claim 14 recites that the gas supply means (21, 25, 22, 26) includes a second mass flow regulator (26) configured to regulate the second gas to a second flow rate to the plasma reactor (100). *Specification* at page 5, lines 7 to 10. Claim 14 recites that the first flow regulator (22) and the second flow regulator (26) are configured to regulate the respective first and second flow rates to provide an ideal stochiometric conversion of the first gas and the second gas to chlorine trifluoride. *Specification* at page 8, lines 27 to 28.

Independent claim 20 relates to a method for generating chlorine trifluoride. *Specification* at page 2, lines 13 to 20. Claim 20 recites that the method includes generating a high-density plasma (105) in a plasma reactor (100). *Specification* at page 2, line 27 to page

3, line 2. Claim 20 recites that the method includes supplying to the plasma reactor (100) a first gas and a second gas, which react with one another under the influence of the high-density plasma (105) in the plasma reactor (100), forming chlorine trifluoride. *Specification* at page 2, line 27 to page 3, line 2. Claim 20 recites that a ratio of the amount of the first gas and the amount of the second gas are selected to achieve an ideal stochiometric conversion to chlorine trifluoride. *Specification* at page 8, lines 27 to 28.

Independent claim 27 relates to a method of generating chlorine trifluoride. *Specification* at page 2, lines 13 to 20. Claim 27 recites that the method includes generating a high-density plasma (105) in a plasma reactor (100). *Specification* at page 2, line 27 to page 3, line 2. Claim 27 recites that the method includes supplying to the plasma reactor (100) a first gas according to a first gas flow rate. *Specification* at page page 2, line 27 to page 3, line 2 and page 8, lines 27 to 28. Claim 27 recites that the method includes supplying to the plasma reactor (100) a second gas according to a second gas flow rate. *Specification* at page 2, line 27 to page 3, line 2 and page 8, lines 27 to 28. Claim 27 recites that the first gas and the second gas react with one another under the influence of the high-density plasma to form chlorine trifluoride in the plasma reactor (100). *Specification* at page 2, line 27 to page 3, line 2. Claim 27 recites that a ratio of the first gas flow to the second gas flow is selected to achieve an ideal stochiometric conversion to chlorine trifluoride. *Specification* at page 8, lines 27 to 28.

Independent claim 29 relates to a method. *Specification* at page 2, lines 13 to 20. Claim 29 recites that the method includes generating a high-density plasma (105) in a plasma reactor (100). *Specification* at page 2, line 27 to page 3, line 2. Claim 29 recites that the method includes supplying to the plasma reactor (100) a first gas. *Specification* at page 2, line 27 to page 3, line 2. Claim 29 recites that the method includes supplying to the plasma reactor (100) a second gas. *Specification* at page 2, line 27 to page 3, line 2. Claim 29 recites that the method includes reacting the first gas and the second gas under the influence of the high-density plasma to form chlorine trifluoride in the plasma reactor (100). *Specification* at page 2, line 27 to page 3, line 2. Claim 29 recites that the method includes transferring the formed chlorine trifluoride to a process chamber (10) assigned to the plasma reactor (100). *Specification* at page 4, line 31 to page 5, line 5. Claim 29 recites that the method includes etching a silicone substrate in the process chamber (10) using the formed chlorine trifluoride as an etching gas. *Specification* at page 3, lines 18 to 33.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Whether claims 14, 16 to 22, 27, 29, and 30 are patentable under 35 U.S.C. § 103(a) over the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al.

B. Whether claim 15 is patentable under 35 U.S.C. § 103(a) over the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and Ye et al.

C. Whether claims 23 and 26 are patentable under 35 U.S.C. § 103(a) over the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., Mori et al.

D. Whether claim 24 is patentable under 35 U.S.C. § 103(a) over the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and Ikeda et al.

E. Whether claim 25 is patentable under 35 U.S.C. § 103(a) over the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and Ye et al.

F. Whether claims 28 and 31 are patentable under 35 U.S.C. § 103(a) over the combination of AAPA, Walter et al., Suto et al., and Yamazaki et al.

7. ARGUMENT

A. Rejection of Claims 14, 16 to 22, 27, 29, and 30 Under 35 U.S.C. § 103(a)

Claims 14, 16 to 22, 27, 29, and 30 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. It is respectfully submitted that the present rejection should be reversed for at least the following reasons.

As an initial matter, Appellant traverses any and all assertions of inherency contained in the Final Office Action. As regards the alleged inherency of chlorine trifluoride in the apparatus of Suto et al., the apparatus and base gases disclosed in Walter et al. differ substantially from the disclosure of Suto et al. Thus, the purported generation of chlorine trifluoride in Walter et al. does not in any way establish or support any contention that chlorine trifluoride would *necessarily* be generated under the conditions disclosed in Suto et al. Thus, the assertion of inherency is plainly deficient. *See In re Robertson*, 169 F.3d 743, 745, 49 U.S.P.Q.2d 1949, 1950–51 (Fed. Cir. 1999). Nonetheless, the present rejection should be reversed for at least the following additional reasons.

Regarding the combination of references relied upon by the Examiner, Appellant disagrees with the Examiner's contention at page 8 of the Final Office Action that AAPA "teaches a method and apparatus that discloses benefit of using ClF3 for etching

silicon substrates." In this regard, the portion of the Specification (page 1, lines 10 to 20) cited by the Examiner does not disclose any apparatus. The Examiner argues at page 2 of the Advisory Action that the process described by AAPA would inherently utilize some form of apparatus. However, even if some apparatus would be required to practice the process disclosed by AAPA, there is no disclosure in AAPA of any structure whatsoever of the allegedly inherently disclosed apparatus. Thus, it is entirely unclear what features would be modified in view of the other cited references and how such modifications would be incorporated.

Appellant also disagrees with the Examiner's contention at page 9 of the Final Office Action that "it would have been obvious to one of ordinary skills [sic] in the art at the time of the invention to regulate the process parameters like pressure and flow rates of first and second gases as taught by Walter et al. in the apparatus of admitted prior art to obtain enhanced etching rate of substrates." Contrary to this contention, Walter et al. discloses an apparatus with a *single tank holding the gas composed of one or more substances*. Col. 2, lines 49 to 55. *Thus, any flow control would only apply to the single gas contained in the tank*. As such, Walter et al. does not disclose, or even suggest providing first and second gases to a plasma reactor, or regulating flow rates of first and second gases provided to a plasma reactor. Moreover, *Walter et al. makes clear that the flow rate is inconsequential except to the extent that it may affect the glow discharge*. See col. 3, lines 4 to 6.

Since Walter et al. teaches only a single gas supply tank, any mention of stochiometric proportions of fluorine and chlorine atoms necessarily refers to the proportion of these atoms present in the single source of reactant gas. Thus, as regards stochiometric ratios, Walter et al. at most describes providing a stochiometric ratio of atoms in a *single supply gas* for formulation of chlorine *pentafluoride*. Furthermore, since Walter et al. discloses chlorine trifluoride as a readily available reactant gas, it is unclear why Walter et al. would lead one of ordinary skill in the art to modify the apparatus of Walter et al. to be stochiometrically optimized to generate chlorine trifluoride.

The Examiner contends at page 2 of the Advisory Action, however, that:

> Examiner responds that the term "a tank" in Walters (col. 2, line 50) could include more than one tank. Further, even if (for the sake of argument) there was one tank containing the mixture of two gases, there would obviously be at least two tanks/source upstream of this said "one tank" to contain the two constituent gases (e.g. fluorine and chlorine). Thus the control would necessarily include control of pressure, flow rate of each of the individual (two) gases, since the reactant gas is

> continuously supplied to the glow discharge cell. Further, Walters also teach that with the glow discharge ClF5 and other gases including ClF3 could be continuously withdrawn from the apparatus of Walters (Walters - col. 1, lines 40-58). Thus the apparatus of AAPA in view of Walters is considered capable of producing ClF3. Further, one of skill in the art and looking to obtain ClF3 would obviously control flow rates etc of both the constituent gases to obtain stochiometric conversion of the constituent gases to optimize the yield of ClF3, in view of Walters's teaching of controlling stochiometrically proportions of atoms to obtain optimum yield. Additionally, optimizing the gas flows etc to stochiometric proportions to optimize the yield would be obvious to one of skill in the art.

In this regard, the entire quoted argument is premised on *a disclosure that is plainly not present in Walter et al.* Contrary to the Examiner's assertions, *Walter et al. in no way teaches or suggests that "a tank" means multiple tanks, nor that flow rates of two gases are controlled individually*. Rather, Walter et al. plainly teaches a single tank holding a single gaseous mixture.

Further, the Examiner's assertion that "there would obviously be at least two tanks/source upstream of this said 'one tank' to contain the two constituent gases" is without any apparent basis. As best understood by Appellant, the Examiner is speculating that although Walter et al. plainly discloses only a single tank for the reactant gas, the system also includes two other tanks upstream of the single tank. It is entirely unclear why the apparatus of Walter et al. would require separate tanks upstream of the single tank holding the reactant gas. Contrary to the Examiner's contentions, Walter et al. provides no disclosure or suggestion whatsoever of continuously forming the reactant gas from separate upstream tanks as part of the disclosed apparatus. Rather, the apparatus of Walter et al. is disclosed as utilizing a single supply tank holding the reactant gas. *See* Walter et al. at col. 2, lines 48 to 54.

Regarding Suto et al., the gases supplied to the microwave tube are converted largely to radical F and Cl atoms, which then react with either the silicon substrate or chlorine gas introduced by a separate inlet into the process chamber. *See* Suto et al. at page 2032. Since the apparatus of Suto et al. is arranged such that a substantial portion of the atoms interact—after leaving the microwave tube—with either the silicon substrate or the separately introduced chlorine gas, there would be no apparent reason to provide the NF3 and Cl2 gas into the microwave tube in any particular stochiometric ratio.

Further regarding Suto et al., Appellant disagrees with the assertion at page 10 of the Final Office Action that "[s]ince Suto teaches production of interhalogen ClF during the process, few molecules of ClF3 would also be produced during the process, considering the teaching of Walter et al. that ClF3 could be produced under glow discharge conditions." Further to the discussion of inherency set forth above, whether or not chlorine trichloride "could" be produced in the apparatus of Walter does not in any way establish that chlorine trifluoride would *necessarily* be produced.

As further regards claim 19, even if Suto et al. disclosed the formation of some minute amount of chlorine trifluoride—which Suto et al. does not—there would still be no teaching or suggestion of etching a silicone substrate in the process chamber using the hypothetical chlorine trifluoride gas.

Yanagisawa et al. also relates to converting gases into radicals that act directly on a substrate. *See, e.g.*, para. [0004]. As was the case with Suto et al., there would be no apparent reason to provide the supply gases of Yanagisawa et al. into the microwave generator according to any particular stochiometric ratio.

As indicated above, the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. does not disclose, or even suggest, a gas supply means including a first mass flow regulator configured to regulate the first gas to a first flow rate to the plasma reactor, and a second mass flow regulator configured to regulate the second gas to a second flow rate to the plasma reactor, wherein the first flow regulator and the second flow regulator are configured to regulate the respective first and second flow rates to provide an ideal stochiometric conversion of the first gas and the second gas to chlorine trifluoride, as recited in claim 14.

Likewise, the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. do not disclose, or even suggest, supplying to a plasma reactor a first gas and a second gas, which react with one another under the influence of a high-density plasma in the plasma reactor, forming chlorine trifluoride, a ratio of the amount of the first gas and the amount of the second gas being selected to achieve an ideal stochiometric conversion to chlorine trifluoride, as recited in claim 20.

The combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. also does not disclose or even suggest supplying to a plasma reactor a first gas according to a first gas flow rate, supplying to the plasma reactor a second gas according to a second gas flow rate, wherein the first gas and the second gas react with one another under the influence of the high-density plasma to form chlorine trifluoride in the plasma reactor, and a ratio of the

first gas flow to the second gas flow is selected to achieve an ideal stochiometric conversion to chlorine trifluoride as recited in claim 27.

As further indicated above, the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. does not disclose, or even suggest, supplying to a plasma reactor a first gas and a second gas, reacting the first gas and the second gas under the influence of the high-density plasma to form chlorine trifluoride in the plasma reactor; and transferring the formed chlorine trifluoride to a process chamber assigned to the plasma reactor, and etching a silicone substrate in the process chamber using the formed chlorine trifluoride as an etching gas, as recited in claim 29.

As set forth above, the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. does not disclose or suggest all of the features of any of claims 14, 20, 27, and 29. As such, it is respectfully submitted that the combination of AAPA, Walter et al, Suto et al., and Yanagisawa et al. does not render unpatentable any of claims 14, 20, 27, and 29, or any of claims 14, 16 to 19, 21, 22 and 30, each of which depends from one of claims 14, 20, and 29. Accordingly, withdrawal of this rejection is respectfully requested.

In view of the foregoing, it is plainly apparent that the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. fails to disclose, or even suggest, all of the features set forth in claims 14, 20, 27, and 29. Accordingly, it is plainly apparent that the combination of Jo and Doyle fails to render unpatentable claims 14, 20, 27, and 29. That is, the Final Office Action does not establish a *prima facie* case of obviousness -- as it must -- consistent with the Supreme Court's decision in *KSR International Co. v. Teleflex Inc.*, 550 U.S. _, 82 U.S.P.Q.2d 1385 (2007).

Since each of claims 16 to 16, 21, 22, and 30 depends from one of claims 14, 20, 27, and 29, the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. also fails to render unpatentable claims 16 to 16, 21, 22, and 30. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988) (any dependent claim that depends from a non-obvious independent claim is non-obvious).

In view of all of the foregoing, reversal of the present rejection is respectfully requested.

B. Rejection of Claim 15 Under 35 U.S.C. § 103(a)

Claim 15 stands rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and Ye et al. It is

respectfully submitted that the present rejection should be reversed for at least the following reasons.

Claim 15 depends from claim 14. As indicated above, the combination of AAPA, Walter et al., Suto et al. and Yanagisawa et al. does not render unpatentable claim 14. Ye et al. does not cure the critical deficiencies of the combination of AAPA, Walter et al., Suto et al. and Yanagisawa et al. As such, it is respectfully submitted that the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and Ye et al. does not render unpatentable claim 15, which depends from claim 14. *See In re Fine* (any dependent claim that depends from a non-obvious independent claim is non-obvious). Accordingly, reversal of this rejection is respectfully requested.

C. Rejection of Claims 23 and 26 Under 35 U.S.C. § 103(a)

Claims 23 and 26 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., Mori et al. It is respectfully submitted that the present rejection should be reversed for at least the following reasons.

Claims 23 and 26 depend from claim 20. As set forth above, the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. does not render unpatentable claim 20. Mori et al. does not cure the critical deficiencies of the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. As such, it is respectfully submitted that the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and Mori et al. does not render unpatentable claims 23 and 26, which depend from claim 20. *See In re Fine* (any dependent claim that depends from a non-obvious independent claim is non-obvious). Accordingly, reversal of this rejection is respectfully requested.

D. Rejection of Claim 24 Under 35 U.S.C. § 103(a)

Claim 24 stands rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and Ikeda et al. It is respectfully submitted that the present rejection should be reversed for at least the following reasons.

Claim 24 depends from claim 20. As set forth above, the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. does not render unpatentable claim 20. Ikeda et al. does not cure the critical deficiencies of the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. As such, it is respectfully submitted that the

combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and Ikeda et al. does not render unpatentable claim 24, which depends from claim 20. *See In re Fine* (any dependent claim that depends from a non-obvious independent claim is non-obvious). Accordingly, reversal of this rejection is respectfully requested.

E. Rejection of Claim 25 Under 35 U.S.C. § 103(a)

Claim 25 stands rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and Ye et al. It is respectfully submitted that the present rejection should be reversed for at least the following reasons.

Claim 25 depends from claim 20. As indicated above, the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. does not render unpatentable claim 20. Ye et al. does not cure the critical deficiencies of the combination of AAPA, Walter et al., Suto et al., and Yanagisawa et al. As such, it is respectfully submitted that the combination of AAPA, Walter et al., Suto et al., Yanagisawa et al., and Ye et al. does not render unpatentable claim 25, which depends from claim 20. *See In re Fine* (any dependent claim that depends from a non-obvious independent claim is non-obvious). Accordingly, reversal of this rejection is respectfully requested.

F. Rejection of Claims 28 and 31 Under 35 U.S.C. § 103(a)

Claims 28 and 31 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of AAPA, Walter et al., Suto et al., and Yamazaki et al. It is respectfully submitted that the present rejection should be reversed for at least the following reasons.

Claim 28 depends from claim 27. As set forth above, the combination of AAPA, Walter et al., and Suto et al. does not render unpatentable claim 27. Yamazaki et al. does not cure the critical deficiencies of the combination of AAPA, Walter et al., and Suto et al. As such, it is respectfully submitted that the combination of AAPA, Walter et al., Suto et al., and Yamazaki et al. does not render unpatentable claim 28, which depends from claim 27. *See In re Fine* (any dependent claim that depends from a non-obvious independent claim is non-obvious).

Claim 31 depends from claim 29. As set forth above, the combination of AAPA, Walter et al., and Suto et al. does not render unpatentable claim 29. Yamazaki et al. does not cure the critical deficiencies of the combination of AAPA, Walter et al., and Suto et al. As such, it is respectfully submitted that the combination of AAPA, Walter et al., Suto et

al., and Yamazaki et al. does not render unpatentable claim 31, which depends from claim 29. *Id.*

In view of the foregoing, reversal of this rejection is respectfully requested.

8. CLAIMS APPENDIX

A "Claims Appendix" is attached hereto and appears on the four (4) pages numbered "Claims Appendix 1" to "Claims Appendix 4."

9. EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R. §§ 1.130, 1.131 or 1.132. No other evidence has been entered by the Examiner or relied upon by Appellant in the appeal. An "Evidence Appendix" is nevertheless attached hereto and appears on the one (1) page numbered "Evidence Appendix."

10. RELATED PROCEEDINGS APPENDIX

As indicated above in Section 2, above, "[t]here are no other prior or pending appeals, interferences or judicial proceedings known by the undersigned, or believed by the undersigned to be known to Appellant or the assignee, ROBERT BOSCH GMBH, 'which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.'" As such, there are no "decisions rendered by a court or the Board in any proceeding identified pursuant to [37 C.F.R. § 41.37(c)(1)(ii)]" to be submitted. A "Related Proceedings Appendix" is nevertheless attached hereto and appears on the one (1) page numbered "Related Proceedings Appendix."

11. CONCLUSION

For at least the reasons indicated above, Appellant respectfully submits that the art of record does not disclose or suggest the subject matter as recited in the claims of the above-identified application. Accordingly, it is respectfully submitted that the subject matter as set forth in the claims of the present application is patentable.

In view of all of the foregoing, reversal of all of the rejections set forth in the Final Office Action is therefore respectfully requested.

Respectfully submitted,

/Clifford A. Ulrich/

Dated: December 10, 2010

By Clifford A. Ulrich (Reg. No. 42,194) for:
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CLAIMS APPENDIX

14. A device for generating chlorine trifluoride comprising:

a plasma reactor (100);

plasma generating means (110, 120, 130, 150, 155, 160, 170, 180) via which a high-density plasma (105) can be generated in the interior of the plasma reactor (100);

a first gas;

a second gas selected to react with the first gas to form chlorine trifluoride when under the influence of a high-density plasma; and

gas supply means (21, 25, 22, 26) via which the first gas and the second gas can be supplied to the plasma reactor (100), these gases reacting with one another under the influence of the high-density plasma (105) in the plasma reactor (100), forming chlorine trifluoride, and a gas outlet (20) via which the formed chlorine trifluoride can be removed from the plasma reactor (100), the gas supply means including

a first mass flow regulator configured to regulate the first gas to a first flow rate to the plasma reactor, and

a second mass flow regulator configured to regulate the second gas to a second flow rate to the plasma reactor,

wherein the first flow regulator and the second flow regulator are configured to regulate the respective first and second flow rates to provide an ideal stochiometric conversion of the first gas and the second gas to chlorine trifluoride.

15. The device according to Claim 14, wherein the plasma generating means include a coil (110), an adaptation network (120), and a high-frequency generator (130).

16. The device according to Claim 14, wherein the plasma generating means include a microwave hollow conductor (150), tuning elements (155), a magnetron (170), a circulator (160), and a hollow conductor terminating element (180).

17. The device according to Claim 14, wherein the plasma reactor (100) includes a quartz tube or a hollow quartz body having a polished interior wall or a ceramic tube or a hollow ceramic body having a polished interior wall or being made of aluminum oxide.

18. The device according to Claim 14, wherein first mass flow regulator (22) is adjustable, and the second mass flow regulator (26) is adjustable.

19. A system for etching semiconductor substrates, comprising: the device (6) according to Claim 14, a process chamber (10), which is connected to the plasma reactor (100) via the gas outlet (20), being assigned to it, the semiconductor substrate (30) being situated in the process chamber (10) and being exposed to the gaseous chlorine trifluoride generated by the device (6) for generating chlorine trifluoride.

20. A method for generating chlorine trifluoride, comprising: generating a high-density plasma (105) in a plasma reactor (100), and supplying to the plasma reactor (100) a first gas and a second gas, which react with one another under the influence of the high-density plasma (105) in the plasma reactor (100), forming chlorine trifluoride, a ratio of the amount of the first gas and the amount of the second gas being selected to achieve an ideal stochiometric conversion to chlorine trifluoride.

21. The method according to Claim 20, wherein the high-density plasma (105) is generated using inductive high-frequency excitation or microwave excitation.

22. The method according to Claim 20, wherein a gas which includes Cl_2 or HCl is used as the first gas, and a gas which includes NF_3, F_2, SF_6 is used as the second gas.

23. The method according to Claim 20, wherein oxygen as an additional gas is supplied to the plasma reactor (100) or to a process chamber (10) downstream from the plasma reactor (100).

24. The method according to Claim 20, wherein the generated chlorine trifluoride is separated from hydrogen fluoride and other gas components, using a filter downstream from the plasma reactor (100).

25. The method according to Claim 20, wherein the first gas and the second gas are supplied to the plasma reactor (100) in such a way that fluoride atoms and chlorine atoms, in the form of radicals or reactive species, are present in the high-density plasma (105) at a 3:1 ratio.

26. The method according to Claim 20, wherein the high-density plasma (105) is generated having a density in radicals or reactive species of at least 10^{11} particles per cm^3, in particular at least 10^{12} particles per cm^3.

27. A method of generating chlorine trifluoride, comprising:

generating a high-density plasma in a plasma reactor;

supplying to the plasma reactor a first gas according to a first gas flow rate; and

supplying to the plasma reactor a second gas according to a second gas flow rate, wherein

the first gas and the second gas react with one another under the influence of the high-density plasma to form chlorine trifluoride in the plasma reactor, and

a ratio of the first gas flow to the second gas flow is selected to achieve an ideal stochiometric conversion to chlorine trifluoride.

28. The method of claim 27, further comprising:

supplying the chlorine trifluoride gas from the plasma reactor to a process chamber, wherein a gas flow of the chlorine trifluoride from the plasma reactor to the process chamber is greater than 100 sccm.

29. A method comprising:

generating a high-density plasma in a plasma reactor;

supplying to the plasma reactor a first gas; and

supplying to the plasma reactor a second gas;

reacting the first gas and the second gas under the influence of the high-density plasma to form chlorine trifluoride in the plasma reactor; and

transferring the formed chlorine trifluoride to a process chamber assigned to the plasma reactor;

etching a silicone substrate in the process chamber using the formed chlorine trifluoride as an etching gas.

30. The method of claim 29, wherein:

the first gas is supplied to the plasma reactor according to a first gas flow rate;

the second gas is supplied to the plasma reactor according to a second gas flow rate; and

a ratio of the first gas flow to the second gas flow is selected to achieve an ideal stochiometric conversion to chlorine trifluoride.

31. The method of claim 29, wherein a gas flow of the chlorine trifluoride from the plasma reactor to the process chamber is greater than 100 sccm.

EVIDENCE APPENDIX

No evidence has been submitted pursuant to 37 C.F.R. §§1.130, 1.131, or 1.132. No other evidence has been entered by the Examiner or relied upon by Appellant in the appeal.

RELATED PROCEEDINGS APPENDIX

As indicated above in Section 2 of this Appeal Brief, "[t]here are no other prior or pending appeals, interferences or judicial proceedings known by the undersigned, or believed by the undersigned to be known to Appellant or the assignee, ROBERT BOSCH GMBH, 'which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.'" As such, there are no "decisions rendered by a court or the Board in any proceeding identified pursuant to [37 C.F.R. § 41.37(c)(1)(ii)]" to be submitted.